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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/030,552	05/10/2002	Ayodhya Nath Tiwari	009765-031	8765

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EXAMINER	
MULPURI, SAVITRI	
ART UNIT	**PAPER NUMBER**
2812	

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/030,552	TIWARI ET AL.	
	Examiner	Art Unit	
	Savitri Mulpuri	2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7/12/2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 11-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 11-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This communication is in response to the amendment to claims filed on 7/12/2004.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-9, 11-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Basol in view of Mori Koshiro (JP 63107073) or Kishi Yasuo (JP 01105581) further in view of Deutscher et al (4,255,208).

Basol teaches forming flexible copper indium selenide (CIS) solar cells for wide range of applications for both space and terrestrial applications: successively forming Mo layer, light absorbing CIS layer, light window layer CdS/ZnO layer and ohmic contacts directly on polyimide (KAPTON™) substrate (see abstract, fig.1 table 1 substrate thickness (50 microns). Basol et al does not teach two limitations (1) forming resin layer on a substrate, (2) forming dissolvable intermediate layer such as sodium chloride coated on substrate followed by successive formation of resin layer and I-III-VI or II-VI solar cell layers and removing the substrate by dissolving the intermediate layer.

Koshiro and Yasuo teach forming flexible solar substrate by forming solar cells on the resin layer "2" coated substrate "1"; producing flexible solar cell with resin layer

"2" as support layer; separating the substrate from the resin layer having solar cell for example by dipping in hot water in the invention of Koshiro.

It would have been obvious to one of ordinary skill in the art forming resin layer between polyimide substrate and solar cell layers in the invention of Basol and removing the substrate to have lightweight and thin flexible solar cells as suggested by Koshiro and Yasuo.

However none of the references teach forming intermediate layer of sodium chloride or sodium fluoride and separating the flexible solar cell by dissolving sodium chloride intermediate layer and reusing the substrate.

Deutscher et al teaches forming sodium chloride layer on a substrate of silicon or sapphire substrate; coating the substrate with water dissolvable sodium chloride and forming solar cell device layers and separating substrate from the solar cell formed of silicon or germanium by dissolving the sodium chloride intermediate layer and reusing the substrate (see abstract and all examples).

It would have been obvious to one of ordinary skill in the art to deposit intermediate layer of sodium chloride on polyimide substrate in the invention of Basol prior to form resin layer as suggested by the teaching of Koshiro or Yasuo, removing the thick substrate by dissolving the intermediate layer because such alternative process would remove 50 micron thick substrate by dissolving the intermediate layer and would result flexible solar cells of I-III-VI formed on thin resin layer, which would be useful in several areas such narrow or curved surfaces for electric power generation.. Separation

the substrate through dissolving the intermediate layer is useful for the (1) reuse of the substrate and (2) amenable for mass production9see Deutscher et al, col.2, lines 5-31).

With respect to claim 5, modified invention of Basol, as modified by the teaching of Deutscher et al, would inherently diffuse alkali ions e.g., sodium ions into layers in solar cell, because modified invention of Basol would have sodium chloride as an intermediate layer.

Applicant's arguments with respect to claims 1-9, 11-21have been considered but are moot in view of the new ground(s) of rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Savitri Mulpuri whose telephone number is571-272-1677. The examiner can normally be reached on Monday to Friday 8:00 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on 571-272-1679. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Savitri Mulpuri
Primary Examiner
Art Unit 2812